Data Prepared by Robert W. Harkins

for delivery at

PCB Meeting of The Packaging Institute

Thursday, April 6, 1972

(1) Mean Values for PCB in recycled board analyzed June 1970 to January 1972.

(2) Distribution of PCB in combination paperboard during late 1971 through January 1972.

(3) PCB Transmission to Foods

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GMA

TABLE 1*

Mean Values for PCB (ppm) in Recycled Board
Analyzed During the Period from June 1970 through January 1972

DATE	NUMBER OF SAMPLES	PCB (ppm)	STANDARD DEVIATION
June 1970	3	15.5	11.8
September 1970	3	16.0	6.9
December 1970	2	25.0	1.4
January 1971	8	119.3	151.9
February 1971	43	43.7	40.5
March 1971	23	62.2	55.5
April 1971	10	21.6	8.1
May 1971	35	30.0	29.5
June 1971	39	32.9	30.6
July 1971	25	27.9	20.5
August 1971	22	18.0	8.0
September 1971	86	29.0	35.9
October 1971	96	25.8	33.4
November 1971	21	2.0	0.6
December 1971	17	2.9	2.9
January 1972	8	1.6	0.7

This table represents 441 samples of recycled board analyzed for PCB and includes data from pages 14, 15 and 16 in the 31-page tabular report.

* Data compiled by the GMA Technical Committee for Food Protection.

PCB TRANSMISSION TO FOODS *

In order to determine the rate and extent of transmission of PCB from cartons to food, the following experiment was set up:

Two foods were selected, one high fat product (grated parmesan cheese - approximately 30 percent fat) and one low fat product (noodles - 2 to 3 percent fat), since it was hypothesized that PCB would favor migration to high fat foods.

Cheese or noodles were packed in cartons approximately 4 inches by 1¼ inches by 7½ inches. Approximately 100 grams of the food material to be studied were placed directly in the carton or in a glassine bag prior to packaging. Cartons were selected from inventory having high, medium and low PCB content, that is, over 50 ppm, between 15 and 50 ppm, and less than 10 ppm, respectively. Not all cartons met these specifications which could not be determined until the carton was destroyed at the end of each individual sampling. The data are summarized in graphs I through V. Each point is an average of two determinations on two separate boxes packed the same way.

Graph I shows PCB transmission into parmesan cheese in high, medium and low PCB boxes when in direct contact with the box and Graph II, when placed in glassine bags. Graphs III and IV show the results with whole noodles. Graph V shows the rate of transmission and extent of transmission of PCBs into grated parmesan cheese, whole noodles and ground noodles.

RESULTS

1. It is apparent that the greater the amount of PCB in the carton, the more extensive the transmission of PCB to the food and the greater the rate of transmission.

2. The presence of a glassine barrier decreases the quantity of PCB transmitted to foods and also decreases the rate of transmission.

3. A barrier limits the total quantity of PCB transmitted to food irrespective of the quantity in the carton.

4. The quantity of PCB transmitted to foods does not appear to be a function of the fat content of the food (that is, noodles picked up as much PCB as a high fat product like cheese).

5. Virtually all transmission of PCB from carton to food occurred during the first four weeks of the study.

6. Particle size (i.e. surface area) may be a determinant of the rate of transmission. (Some what conjecture - stated)

* Experiment conducted by Kraft Foods

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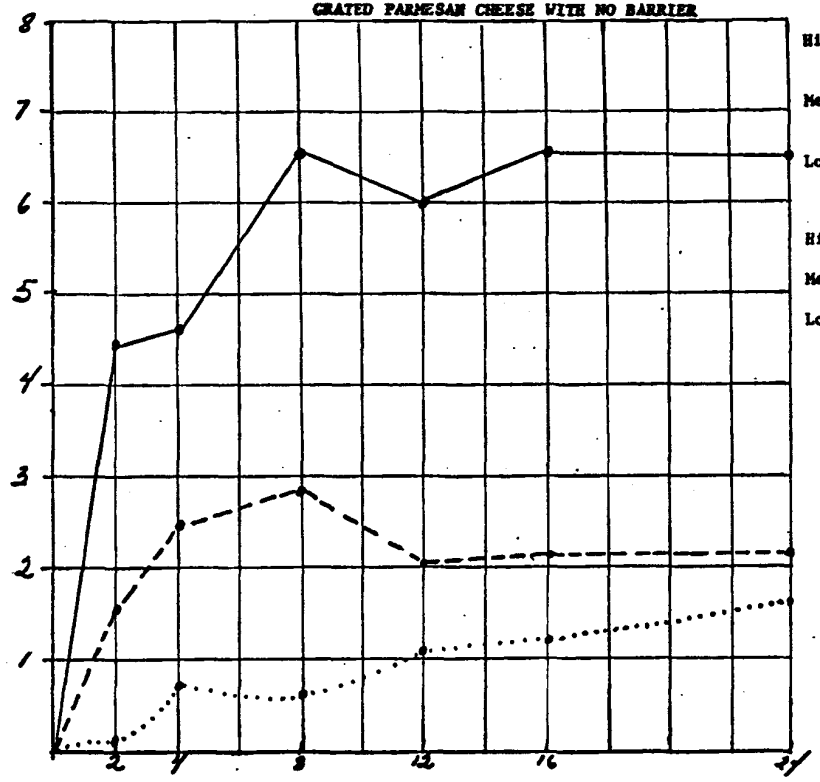
GMA Summarized by Grocery Manufacturers of America, Inc., April 3, 1972.

GRAPH I

GRATED PARMESAN CHEESE WITH NO BARRIER



High PCB Cartons: 34 - 185

Medium PCB Cartons: 12 - 46

Low PCB Cartons: 2.4 - 9.3

High PCB _____

Medium PCB _ _ _ _ _

Low PCB . . . . . .

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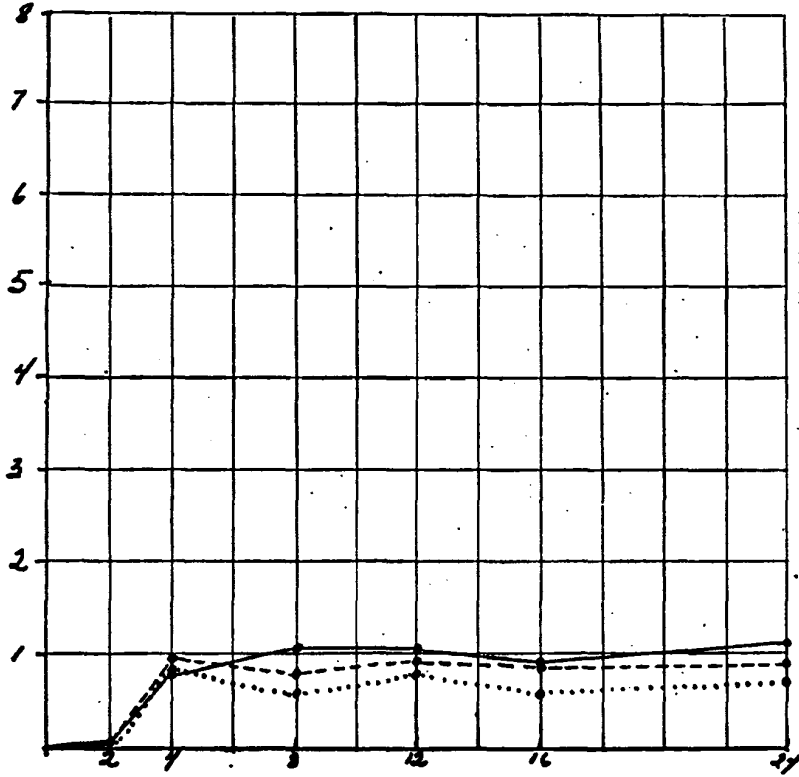
GRAPH II

GRATED PARMESAN CHEESE WITH GLASSINE BARRIER



High PCB Cartons: 34 - 185

Medium PCB Cartons: 12 - 46

Low PCB Cartons: 2.4 - 9.3

High PCB _____

Medium PCB _ _ _ _

Low PCB . . . . . .

ppm PCB in Food

Weeks in Storage

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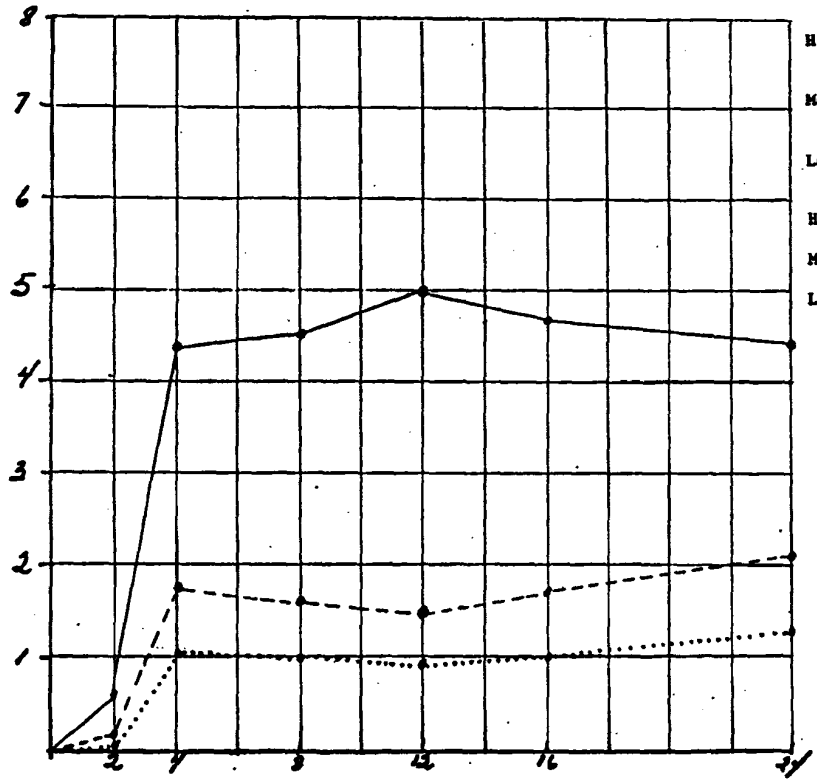
GRAPH III

WHOLE NOODLES WITH NO BARRIER



High PCB Cartons: 34 - 190

Medium PCB Cartons: 10.6 - 52

Low PCB Cartons: 2.1 - 7.4

High PCB _____

Medium PCB _ _ _ _ _ _

Low PCB . . . . . .

ppm PCB in Food

Weeks in Storage

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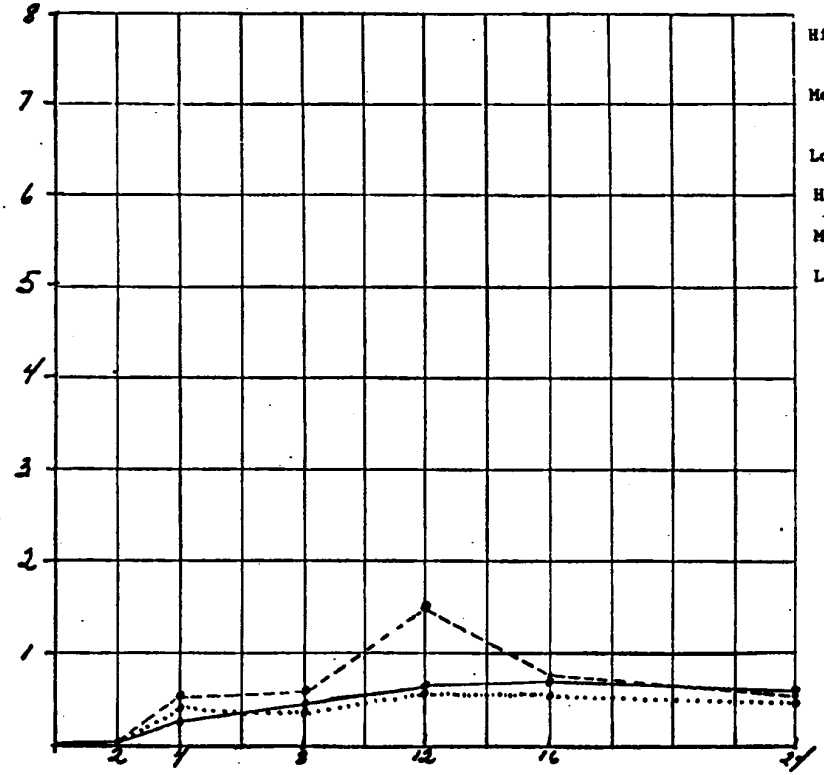
WHOLE NOODLES WITH GLASSINE BARRIER



High PCB Cartons: 34 - 190

Medium PCB Cartons: 10.6 - 52.6

Low PCB Cartons: 2.1 - 7.4

High PCB _____

Medium PCB _ _ _ _

Low PCB . . . . . .

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GRAPH V

